EEMB CO., LTD

Polymer Li-ion Battery

Specification

Model:	**LP103450LC-PCM-LD/**
Capacity:	**1800mAh**

Prepared	Checked	Approved

Customer:

Customer Approval（Customer confirmation）:		
Signature	**Checked**	**Approved**

Address: Room ABCD,25/F, Block A, Fortune Plaza, NO.7060 Shennan Road Shenzhen, China

Postal code: 518040

Phone: 0086-755-83022275 FAX: 0086-755-83021966

http://www.eemb.com

Catalog

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1. Scope

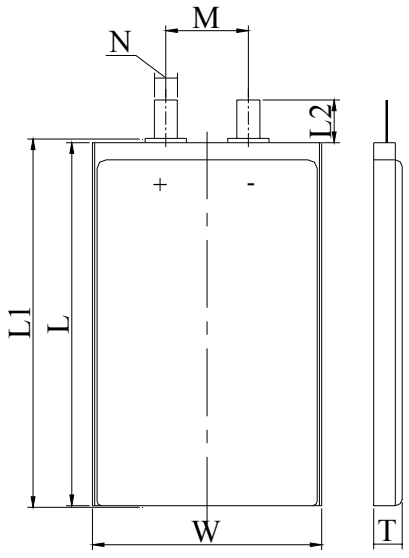
This product specification defines the requirements of the rechargeable polymer lithium-ion battery supplied to the customer by EEMB Co., Ltd.

2. Product Basic Characteristics

No.	Item		Characteristics		Remark
2.1	Model		LP103450LC		
2.2	Capacity	Nominal Capacity	1800	mAh	0.2C_5A
		Minimum	1700	mAh	0.2C_5A
2.3	Nominal Voltage		3.7	V	
2.4	Weight		Approx. 36	g	
2.5	Internal Impedance		≤ 100	mΩ	AC 1KHz（50%charge）
2.6	Dimension	Length	≤ 51	mm	
		Width	≤ 34.5	mm	
		Thickness	≤ 10.3	mm	
2.7	Charge	Maximum Current	1800	mA	1.0C_5A（CC&CV）
		Limited Voltage	4.200±0.020	V	
		End-of Current	36	mA	
2.8	Discharge	Maximum Current	3600	mA	2.0C_5A
		Cut-off Voltage	2.750±0.005	V	
2.9	Operation Temperature	Charge	0 ~ 45	℃	
		Discharge	-40 ~ +45	℃	
2.10	Storage Temperature	1 month	-20 ~ +60	℃	
		3 month	-20 ~ +45	℃	
		12 month	-20 ~ +25	℃	
2.11	Storage Relative Humidity		65±20	%	

3. Shape and Dimensions（Unit：mm）

Item	Specification
T	Max10.3
W	Max34.5
L	Max51
L1	Max52
L2	10±1
M	16±1
N	4±0.5



4. Appearance

It shall be free from any defects such as remarkable scratches, breaks, cracks, discoloration, leakage, or middle deformation.

5. Specification

5.1 Electrical Characteristics

No.	Item	Criteria	Test Instructions
5.1.1	$1C_5A$ rate discharge capacity	Discharge Time≥57min	Full charge at 20±5℃, rest for 1 h, then discharge at the same temperature with $1.0C_5A$ to 2.75V.
5.1.2	High temp. discharge capacity	Discharge Time≥54min	Full charge at 20±5℃, store at 55±2℃ for 2h, then discharge at the same temperature with $1.0C_5A$ to 2.75V.
5.1.3	Low temp. discharge capacity	Discharge Time≥3.0 h	Full charge at 20±5℃, store at -40℃±2℃ for 16h~24h, then discharge at the same temperature with $0.2C_5A$ to 2.75V
5.1.4	Cycle Life	≥300Cycles	After full charge, rest for 10 min, discharge at constant current of $0.5C_5A$ to 2.75V. Batteries are full charge after 10 minutes. Repeat above steps till two continuous cycle discharge time less than 96min
5.1.5	Capacity Retention	Discharge Time≥4.5 h	After full charge, store at 20±5℃for 28 days. Then discharge with $0.2C_5A$ to 2.75V

5.2 Acclimatization Characteristics

No.	Item	Criteria	Test Instructions
5.2.1	High Temp. and High Humidity	No deformation, no rust, no fire or explosion; Discharge time ≥36min	After full charge, store at 40℃±2℃(90%~95%RH) for 48h. After test, place at 20℃±5℃ for 2h and then discharge with $1C_5A$ to end-voltage
5.2.2	Vibration	No damnification, leakage, no fire or explosion; Battery Voltage≥3.6V	Batteries are vibrated 30 min in three mutually perpendicular directions with amplitude of 0.38mm (10~30Hz) or 0.19mm (30~55Hz) and the scanning rate of 1oct per min
5.2.3	Drop	No leakage, no fire or explosion; Discharge Time≥51 min	Batteries are dropped onto a hard board with the thickness of 18~20mm from 1meter

5.3 Safety Characteristics

No.	Item	Criteria	Test Instructions
5.3.1	Overcharge	No fire or explosion	Charged the cells at 3C$_5$A current 20±5℃ with a voltage limit of 4.8V and Current close to 0 A
5.3.2	Short-Circuit	No fire or explosion; The maximum Temperature: 150℃	Batteries are short-circuited by connecting the positive and negative terminals for 1h with a resistance load of 0.1 Ω
5.3.3	Heating	No fire or explosion	Cell is heated in a circulating air oven at a rate of (5±2)℃ per minute to130±2℃, and then placed for 30 minutes at 130±2℃
Note: Unless otherwise specified, all tests stated in this specification are conducted at the following conditions: Temp. : 20±5℃; Relative Humidity: 25%～85%.			

6. Specification of PCM

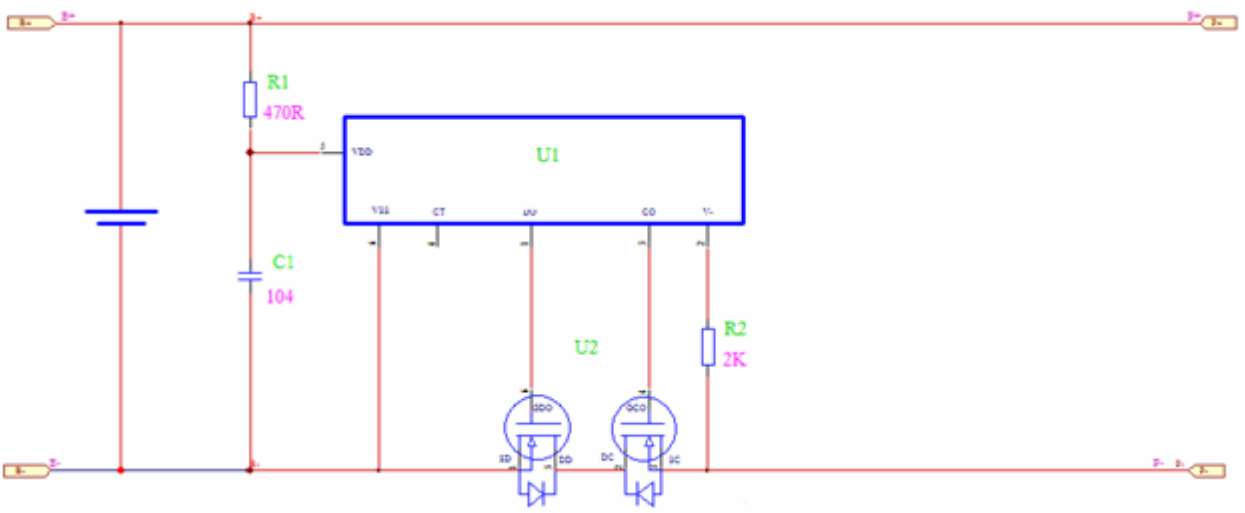
The specification shall be applied to Lithium polymer battery protection circuit module manufactured by EEMB CO., LTD.

6.1.0 Basic Specification(T=25℃)

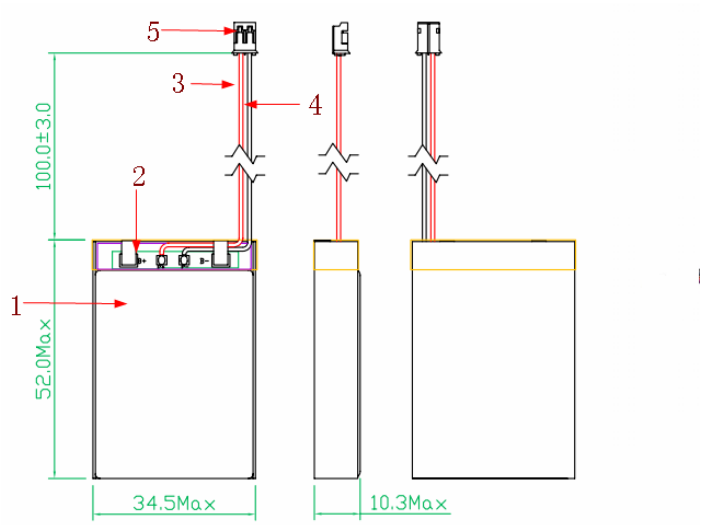
Item	Symbol	Content	Criterion
Over charge Protection	V_{DET1}	Over charge detection voltage	4.28±0.05V
	tV_{DET1}	Over charge detection delay time	0.96S-1.40S
	V_{REL1}	Over charge release voltage	4.175±0.025V
Over discharge protection	V_{DET2}	Over discharge detection voltage	3.0±0.10V
	tV_{DET2}	Over discharge detection delay time	115ms-173ms
	V_{REL2}	Over discharge release voltage	3.5±0.050V
Over current protection	V_{DET3}	Over current detection voltage	0.10±0.015V
	I_{DP}	Over current detection current	2-6A
	tV_{DET3}	Detection delay time	7.2ms-11.0ms
		Release condition	Cut load
Short protection		Detection condition	Exterior short circuit
		Release condition	Cut short circuit
Interior resistance	R_{DS}	Main loop electrify resistance	VC=4.2V,R_{DS}≤70mΩ
Current consumption	I_{DD}	Current consume in normal operation	3.0μA Type 7.0μA Max

*Note: These specs are guaranteed by design not by production tests.

6.2.0 PCM Circuit Diagram



7. Pack's Dimension



1. Drawing:
T（max）=10.3mm
W（max）=34.5mm
H（max）=52mm
L=100±3.0mm

2. Materials:
① cell：LP103450LC
② PCM
③Wire: red（＋） UL1007 24AWG
④Wire: black (—) UL1007 24AWG
⑤Plug: JST-PHR-02

8. Pack's voltage and internal resistance

Voltage：3.83~3.9V

Internal Resistance：≤200mΩ

9. Matters needing attention

Strictly observes the following needing attention. EEMB will not be responsible for any accident occurred by handling outside of the precautions in this specification.

! Danger

- Strictly prohibits heat or throw cell into fire.
- Strictly prohibits throw and wet cell in liquid such as water、gasoline or drink etc.
- Strictly prohibits use leave cell close to fire or inside of a car where temperature may be above 60℃. Also do not charge / discharge in such conditions.
- Strictly prohibits put batteries in your pockets or a bag together with metal objects such as necklaces. Hairpins, coins, or screws. Do not store or transportation batteries with such objects.
- Strictly prohibits short circuit the (+) and (-) terminals with other metals.
- Do not place Cell in a device with the (+) and (-) in the wrong way around.
- Strictly prohibits pierce Cell with a sharp object such as a needle.
- Strictly prohibits disassemble or modify the cell.
- Strictly prohibits welding a cell directly.
- Do not use a Cell with serious scar or deformation.
- Thoroughly read the user's manual before use, inaccurate handling of lithium ion rechargeable cell may cause leakage, heat, smoke, an explosion, or fire, capacity decreasing.

! Warning

- Strictly prohibits put cell into a microware oven, dryer, or high-pressure container.
- Strictly prohibits use cell with dry cells and other primary batteries, or new and old battery or batteries of a different package, type, or brand.
- Stop charging the Cell if charging is not completed within the specified time.
- Stop using the Cell if abnormal heat, odor, discoloration, deformation or abnormal condition is detected during use, charge, or storage.
- Keep away from fire immediately when leakage or foul odor is detected.
- If liquid leaks onto your skin or clothes, wash well with fresh water immediately.
- If liquid leaking from the Cell gets into your eyes, do not rub your eyes. Wash them well with clean edible oil and go to see a doctor immediately.

! Caution

- Before using the Cell, be sure to read the user's manual and cautions on handling thoroughly.
- Charging with specific charger according to product specification. Charge with CC/CV method. Strictly prohibits revered charging. Connect cell reverse will not charge the cell. At the same time, it will reduce the charge-discharge characteristics and safety characteristics; this will lead to product heat and leakage.
- Store batteries out of reach of children so that they are not accidentally swallowed.
- If younger children use the Cell, their guardians should explain the proper handling.
- Before using the Cell, be sure to read the user's manual and cautions on handling thoroughly.
- Batteries have life cycles. If the time that the Cell powers equipment becomes much shorter than usual, the Cell life is at an end. Replace the Cell with a new same one.
- When not using Cell for an extended period, remove it from the equipment and store in a place with low humidity and low temperature.
- While the Cell pack is charged, used and stored, keep it away from objects or materials with static electric charges.

- If the terminals of the Cell become dirty, wipe with a dry clothe before using the Cell.
- Storage the cells in storage temperature range as the specifications. After full discharged, we suggest that charging to 3.7~4.0V with no using for a long time.
- Do not exceed these ranges of the following temperature ranges：

  Charge temperature range : 0℃ to 45℃;

  Discharge temperature range : -40℃ to 45℃.

  Store less than 1 month : -20℃ - +60℃

  Store less than 3 months : -20℃ - +45℃

  Store less than 1 year : -20℃ - +25℃

! Special Notice

Keep the cells in 50% charged state during long period storage. We recommend to charge the battery up to 50% of the total capacity every 3 months after receipt of the battery and maintain the voltage 3.7~4.0V. And store the battery in cool and dry place.